

Claims

1. Method for improving plant growth characteristics, comprising increasing, in a monocotyledonous plant, expression of a nucleic acid encoding an NHX protein and/or increasing activity of an NHX protein, wherein said plant is grown under non-salt stress conditions.
2. Method according to claim 1, wherein said increasing expression and/or increasing activity is effected by introducing and expressing in a plant a nucleic acid encoding an NHX protein or a homologue, derivative or active fragment thereof.
3. Method according to claim 1 or 2, wherein said growth characteristic is increased yield/biomass and/or modified plant architecture.
4. Method according to claim 3, wherein said increased yield/biomass and/or modified plant architecture is selected from the group consisting of: increased aboveground area, increased number of first panicles, increased plant height, increased total number of seeds, increased number of filled seeds, increased total seed weight, increased harvest index and increased thousand kernel weight, each relative to corresponding wild type plants grown under non-salt stress conditions.
5. Method according to any one of claims 1 to 4, wherein said nucleic acid is in the sense orientation and is under the control of a tissue-specific promoter, preferably a seed-specific promoter, further preferably an endosperm-specific promoter such as a prolamin promoter.
6. Method according to any one of claims 1 to 5, wherein said nucleic acid is in the sense orientation and is under the control of a weak constitutive promoter such as a maize ubiquitin promoter minus first intron.
7. Method according to any one of claims 1 to 5, wherein said nucleic acid is of plant origin, preferably from a monocotyledonous plant, for example from the family Poaceae, further preferably from the genus *Oryza*, most preferably the nucleic acid is as represented by SEQ ID NO: 1 or a portion thereof or a sequence capable of hybridizing therewith.

8. Method for the production of a monocotyledonous plant having improved growth characteristics, which method comprises the steps of: (i) introducing and expressing, in a plant, a nucleic acid encoding an NHX protein or a homologue, derivative or active fragment thereof; and (ii) cultivating said plant under non-salt stress conditions.
- 5
9. Plants obtainable by a method according to any one of claims 1 to 8, which plants have improved growth characteristics relative to corresponding wild type plants.
10. Transgenic monocotyledonous plants grown under non-salt stress conditions, said plants having improved growth characteristics, and which plants contain an isolated nucleic acid molecule encoding an NHX protein
11. Plant part, preferably a harvestable plant part, a propagule or progeny from a plant according to claim 9 or 10.
- 15
12. Harvestable parts according to claim 11, wherein said harvestable parts are seeds.
13. Plant according to any one of claims 9 to 11 selected from sugarcane or a cereal such as rice, maize, wheat, barley, millet, rye, oats or sorghum.
- 20
14. Use of a genetic construct in the methods of any one of claims 1 to 8, which construct comprises:
- a) a nucleic acid encoding an NHX protein;
 - b) a control sequence capable of regulating expression of the nucleic acid of (a); and
 - optionally,
 - c) a transcription termination sequence.
- 25
15. Use according to claim 14, wherein said control sequence of (b) comprises a seed-specific promoter, preferably an endosperm-specific promoter.
- 30
16. Use according to claim 14, wherein said control sequence of (b), comprises a weak constitutive promoter such as a maize ubiquitin promoter with deleted first intron.
17. Use according to any one of claims 14 to 16, wherein said nucleic acid is of plant origin, preferably from a monocotyledonous plant, for example from the family Poaceae, further preferably from the genus *Oryza*, most preferably the nucleic acid is as represented by SEQ ID NO: 1 or a portion thereof or a sequence capable of hybridizing therewith.
- 35

18 Use of a nucleic acid encoding an NHX protein and/or use of an NHX protein in improving the growth characteristics of a monocotyledonous plant grown under non-salt stress conditions.

5

19. Use according to claim 18, wherein said growth characteristics comprise increased yield/biomass and/or altered architecture.

20. Use according to claim 18 or 19, wherein said nucleic acid encodes an NHX protein, preferably an NHX1 protein.

10

21. Use of a nucleic acid encoding an NHX protein and/or use of an NHX protein in breeding programs for the breeding of monocotyledonous plants grown under non salt-stress conditions.

15